

**CLAIMS**

1. Apparatus for sampling first and second signals within a signal processing arrangement, said apparatus comprising:

a sampler adapted to sample sections of the waveforms of both the first and second signals,

a switch adapted to alternate connection of the sampler to a point in the arrangement where said first signal can be sampled and a point in said arrangement where said second signal can be sampled and

a timer adapted to time the operation of the switch to cause the sampler to sample a first waveform section of said first signal and a second waveform section of said second signal, wherein:

said second signal is responsive to said first signal and

said timer is arranged to utilise a propagation delay between said points so that said second section at least comprises a portion that has been generated in response to said first section.

2. Apparatus according to claim 1, wherein:

said timer is arranged to time the operation of said switch such that said sampler samples said first and second sections consecutively.

3. Apparatus according to claim 1, wherein:

said timer is arranged to time the operation of said switch such that said sampler samples said second section and then said first section.

4. Apparatus according to claim 1, further wherein:

said arrangement comprises a delay adapted to delay one of said first and second signals relative to the other.

5. Apparatus according to claim 4, wherein:

said delay acts on said first signal.

6. Apparatus according to claim 4, wherein:

said delay acts on said second signal.

7. Apparatus according to claim 1, further comprising:

a controller arranged to use the samples of the first and second sections to produce one or more control signals for application to said arrangement to control the operation of said arrangement.

8. Apparatus according to claim 7, wherein:

said controller comprises a memory adapted to store values derived from said samples and

said controller is arranged to time-align those values that relate to said first signal with those values that relate to said second signal in preparation for deriving from said values said one or more control signals.

9. Apparatus according to claim 7, wherein said controller is arranged:

to obtain from said samples values of a parameter,

to allocate said values into bins and

to average the values within said bins.

10. Apparatus according to claim 7, wherein said controller is arranged:

to obtain from said samples values of a parameter,

to allocate said values into bins and

to use ideal values of said parameter for said bins in order to assess the contents of the bins.

11. Apparatus according to claim 1, wherein:

said arrangement comprises first and second portions, in which digital and analogue signal processing occur respectively, and first and second digital to analogue converters, the first signal is processed in said first portion to produce an intermediate signal,

said first digital to analogue converter provides the intermediate signal to said second portion, and

said second digital to analogue converter provides said first signal to said switch.

12. Apparatus according to claim 11, wherein:

said first portion is adapted to apply a digital delay to said first signal en route to said second digital to analogue converter.

13. Apparatus according to claim 11, further comprising:

a frequency converter adapted to frequency convert said first signal between said second digital to analogue converter and said switch.

14. Apparatus according to claim 11, wherein:

said switch is an IF switch.

15. Apparatus according to claim 1, further comprising:

a subtractor adapted to produce a difference signal from said first and second signals as a third input to said switch for selectable application to said sampler.

16. Apparatus according to claim 7, wherein:

the signal processing arrangement comprises an amplifier and

at least one of said one or more control signals is for controlling the amount of distortion caused by the amplifier during its operation.

17. Apparatus according to claim 16, wherein:

said first signal is a signal to be amplified by said amplifier and

said second signal is the result of amplifying said first signal using said amplifier.

18. A signal processing system comprising:

a signal processing arrangement,

a sampler adapted to sample sections of the waveforms of first and second signals appearing within said arrangement,

a switch adapted to alternate connection of the sampler to a point in the arrangement where said first signal can be sampled and a point in said arrangement where said second signal can be sampled,

a timer adapted to time the operation of the switch to cause the sampler to sample a first waveform section of said first signal and a second waveform section of said second signal and

a controller adapted to use the samples of the first and second sections to

produce one or more control signals for application to said arrangement to control the operation of said arrangement, wherein:

said second signal is responsive to said first signal and

said timer is arranged to utilise a propagation delay between said points so that said second section comprises at least a portion that has been generated in response to said first section.

19. A system according to claim 18, wherein:

said timer is arranged to time the operation of said switch such that said sampler samples said first and second sections consecutively.

20. A system according to claim 18, wherein:

said timer is arranged to time the operation of said switch such that said sampler samples said second section and then said first section.

21. A system according to claim 18, further comprising:

a delay adapted to delay one of said first and second signals relative to the other.

22. A system according to claim 21, wherein:

said delay acts on said first signal.

23. A system according to claim 21, wherein:

said delay acts on said second signal.

24. A system according to claim 9, wherein said controller comprises a memory adapted to store values derived from said samples and said controller is arranged to time-align those values that relate to said first signal with those values that relate to said second signal in preparation for deriving from said values said one or more control signals.

25. A system according to claim 18, wherein said controller is arranged:

to obtain from said samples values of a parameter,

to allocate said values into bins and

to average the values within said bins.

26. A system according to claim 18, wherein said controller is arranged:
- to obtain from said samples values of a parameter,
  - to allocate said values into bins and
  - to use ideal values of said parameter for said bins in order to assess the contents of the bins.
27. A system according to claim 18, wherein:
- said arrangement comprises first and second portions, in which digital and analogue signal processing occur respectively, and first and second digital to analogue converters, said first signal is produced in said first portion and is processed in said first portion to produce an intermediate signal,
  - said first digital to analogue converter provides said intermediate signal to said second portion, and
  - said second digital to analogue converter provides said first signal to said switch.
28. A system according to claim 27, wherein:
- said first portion is adapted to apply a digital delay to the first signal en route to said second digital to analogue converter.
29. A system according to claim 27, further comprising:
- a frequency converter adapted to frequency convert said first signal between said second digital to analogue converter and said switch.
30. A system according to claim 27, wherein:
- said switch is an IF switch.
31. A system according to claim 18, further comprising:
- a subtractor adapted to produce a difference signal from said first and second signals as a third input to said switch for selectable application to said sampler.
32. A system according to claim 18, wherein:
- the signal processing arrangement comprises an amplifier and
  - at least one of said one or more control signals is for controlling the amount of distortion caused by the amplifier during its operation.

33. A system according to claim 32, wherein:

said first signal is a signal to be amplified by said amplifier and

said second signal is the result of amplifying said first signal using said amplifier.